ROCK CHIPS
FALL WINTER 1996
A Newsletter published by the Alberta Geological Survey for the geoscience community of Alberta

AGS becomes part of the Alberta Energy and Utilities Board

From Dr. Jan Boon, Head, Alberta Geological Survey

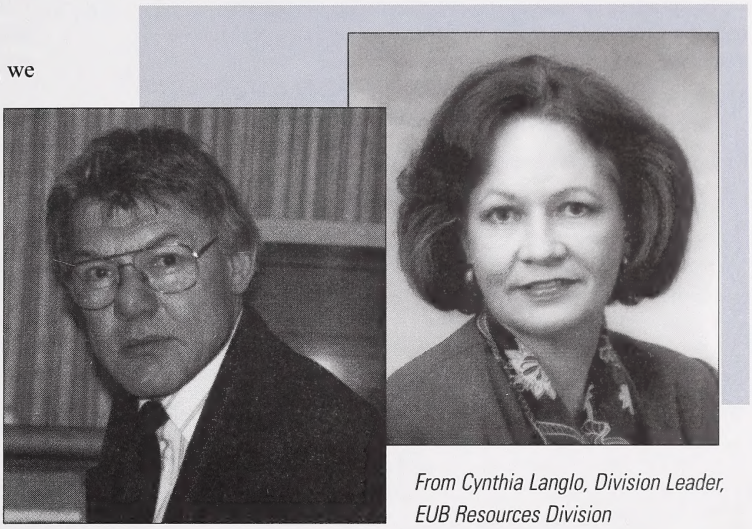
In the Spring/Summer 1996 edition of *Rock Chips*, we announced that the Alberta Geological Survey (AGS) would become part of the Alberta Energy and Utilities Board (EUB). The transition took place on 1 April, 1996.

The changeover was preceded by much preparatory work in finance, human resources and other areas. "New" is the operative word to describe recent changes in our management structure, administrative procedures, letterhead, business cards and the context for our work. One thing that did not change is our location. Thanks to the effort of many in the EUB, the Alberta Department of Energy and AGS, the transition went very smoothly.

AGS is now a part of the EUB Resources Division which has Cynthia Langlo as its leader. The Resources Division employs technical staff such as economists, engineers and geologists, as well as excellent support staff. It has not taken long for AGS staff to start feeling at home in this environment.

There are significant opportunities for synergy in areas such as resource characterization, geological mapping, geoscience information dissemination, stratigraphy, subsurface water resources, core research facilities, log analysis, geographic information systems, land-use planning support and database management. It is our hope to achieve these synergies through the restructuring process.

AGS is pleased to be part of the EUB and looks forward to contributing to and drawing on the organization's strengths and reputation. ❖



From Cynthia Langlo, Division Leader, EUB Resources Division

The addition of AGS to the EUB has been a welcome development. I would like to echo Jan Boon's comments that this move will provide many opportunities to achieve synergy between the two organizations.

We have just begun to explore these opportunities. Over the past few months, we have developed a better understanding of roles especially among the management groups. There have also been occasions for staff to work together and we will increase these. For example, AGS has developed a strong, team-based approach to managing its business. The AGS model has provided an opportunity for the EUB to learn from the AGS experience.

The Resources Division is currently involved in a major restructuring initiative. The timing of the AGS move was fortunate because AGS could participate fully in this initiative. This will ensure a more complete review of roles and provide early opportunities to implement new and improved relationships.

We are very aware of the special identity and history of AGS. It is our goal to maintain this role. At the same time, we will identify areas in which change will allow the Resources Division to better meet the needs of internal and external clients. We look forward to working as a cohesive unit to establish strong relationships among our staff, and new divisional directions that support EUB corporate goals and objectives. ❖

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This issue of Rock Chips is longer than usual because it outlines the AGS programs. Please save this issue for future reference.

EUB Alberta Energy and Utilities Board

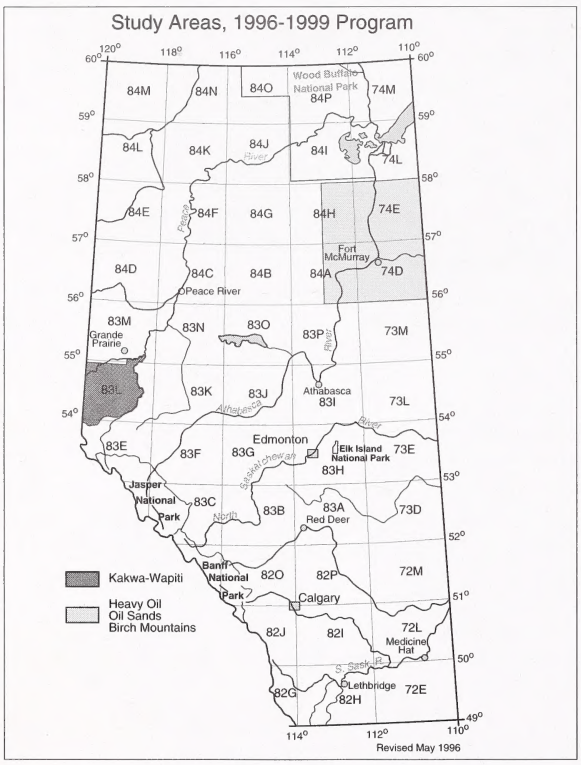
1996 - 1999 Program Overview

The mission of the Alberta Geological Survey (AGS) is: *"To provide the geoscience information and expertise needed by government, industry and the public for earth resources stewardship and sustainable development".*

To optimize the use of the organization's 1996-1999 resources, the AGS decided to focus on integrated and linked studies of two well-defined geographic areas:

1) the heavy oil, oil sands and Birch Mountains area in northeastern Alberta; and

2) the Kakwa-Wapiti area in west central Alberta.



1. Heavy Oil, Oil Sands and Birch Mountains Area (NE Alberta)

The National Task Force on Oil Sands Development is projecting accelerated developments of northeastern Alberta oil sands resources. This scenario is based on reduced mining costs, new Steam Assisted Gravity Drainage (SAGD) technology, and the introduction of generic royalty and tax systems.

Oil sands represent not only a vast bitumen resource, but also have the potential for co-product minerals such as titanium, zirconium, vanadium, nickel, aluminum, gold and rare earth elements. In addition, gold occurrences have been reported in drill core in the Fort McKay, Firebag and Birch Mountains areas and from river sediment from the Athabasca, Clearwater and McIvor Rivers of northeastern Alberta.

> **"Oil sands represent not only a vast bitumen resource, but also have the potential for co-product minerals . . ."**

AGS geologists will also work on projects related to Quaternary geology and stratigraphy, hydrogeology, aggregate, and other industrial minerals projects in northeastern Alberta. These efforts are designed to help address requirements for groundwater supply, residual water disposal, construction materials, limestone for sulphur dioxide scrubbing, steam loss avoidance, and environmental impact mitigation.

For example, a reservoir characterization project will help support plant siting and in-situ process design. A study of the complexities of the geological structure of the oil sands and surrounding area will provide a context for the determination of metallic mineral and diamond potential, and also for SAGD applicability studies. The Quaternary geology project will also help determine metallic mineral and diamond potential. The results of these studies will be combined with cultural, topographic, hydrographic, environmental, First Nation claims, and other information in a Geographic Information System (GIS) through a land-use compilation mapping project.

2. Kakwa-Wapiti Area

The Kakwa-Wapiti area has been identified, through repeated external requests, as an area requiring information for land-use planning. There is activity in petroleum, coal and diamond exploration in the region, in addition to requests for protected areas under the Special Places 2000 Program. AGS clients and stakeholders have recommended an integrated approach to Survey activities, a view shared by AGS. The Kakwa-Wapiti area is well suited to demonstrate the applicability of an integrated effort by AGS to produce a package of information, which would be useful for land-use planning and resource development by industry.

The AGS program for the area will include bedrock geology, regional geochemical sampling and stratigraphic mapping, and Quaternary geology studies. The aim is to develop a framework of the stratigraphy and structural geology and help establish targets for exploration. The mineral aggregate and industrial mineral potential of the area will also be determined.

AGS researchers will develop an approach that maximizes the amount of information which can be obtained from a combination of existing small scale maps, subsurface data, and limited field work. The plan is to produce information at a 1:50,000 scale that is most useful for land-use planning and resource development. ❖

1996 - 1999 Program Highlights

Heavy Oil, Oil Sands, and Birch Mountain Area

- Mapping/ evaluation of mineral aggregate and industrial mineral potential
- Metallic mineral and diamond potential
- Reservoir characterization of the Athabasca oil sands
- Quaternary geology and stratigraphy of Athabasca oil sands and adjacent area
- Hydrogeology of the Athabasca oil sands and adjacent area
- Land-use compilation mapping

Kakwa-Wapiti Area

- Mapping and evaluation of the mineral aggregate and industrial potential
- Regional diamond and metallic mineral potential
- Bedrock geology
- Quaternary geology
- Land-use compilation mapping

Ongoing AGS Projects

New Geological Map of Alberta

by Monica Price, Mineral Database Specialist

A new version of the Geological Map of Alberta is now in production. The map is being revised and updated to replace the 1972 version which is outdated in many aspects and virtually out of print. The new map will be published at a scale of 1:1,000,000.

> **"An up-to-date provincial geological map is an essential tool for promoting exploration in Alberta"**

An up-to-date provincial geological map is an essential tool for promoting exploration in Alberta. Geological mapping since 1972 has rendered the current version obsolete. AGS mapping activity will peak this year to coincide with the wind-up of the Canada-Alberta Mineral Development Agreement mapping projects. Geological boundaries will be revised as new mapping information becomes available, making this an ongoing project.

For more information, contact Monica Price at the Alberta Geological Survey. ❖

General Computing Support

by Barry Fildes, Systems Analyst

The AGS has found that the provision and support of a basic, stable computing infrastructure for the Survey as a whole is an effective Information Technology (IT) strategy. By dedicating resources to the support of common IT resources, staff require less computing knowledge and support. This allows AGS staff to direct a larger part of their efforts to their scientific and administrative tasks. Providing IT support for the scientific effort within the Survey results in a natural responsiveness of the IT infrastructure to the needs of the scientific program.

This year's objectives for the General Computing Support project include:

- continuation of reliable, basic computing infrastructure for AGS scientific and administrative activities in the face of rapid changes to the technological and administrative context of the Survey
- evolution of computing infrastructure in a controlled way to meet the needs of internal and external stakeholders, and to take advantage of technological change without incurring needless expense
- improvements in the transparency of communication links to the Alberta Department of Energy's office automation systems
- setting up transparent links to EUB office automation and business systems
- improvements in technological and administrative mechanisms for data dissemination to external stakeholders. ❖

Mineral Core Research Facility

by Dixon Edwards, Geologist
and Tim Berezniuk, Geological Technologist

Exploration permit holders collect metallic and industrial mineral core and rock samples during the course of exploration in Alberta. The cost of this work can be significant. Duplication is avoided whenever possible by retaining these physical materials for use by other explorationists. AGS is responsible for implementing this retention program under the Metallic Mineral Regulations of the Mineral Agreements Branch of the Alberta Department of Energy.

> **"Duplication is avoided whenever possible by retaining these physical materials for use by other explorationists"**

The department started a diamond drill core selection and storage program in 1979. There are now 31,000 meters of core and about 10,000 rock samples in storage, primarily from the Shield of Northeastern Alberta.

AGS work involves selecting core and samples, as well as cataloguing and storing materials at the Mineral Core Research Facility in Edmonton. The Core Research facility has the following roles:

- it enables permit holders to receive assessment credit used in extending the right to exploration on their permit(s)
- it makes available materials to other explorationists, thereby increasing the effectiveness of exploration programmes or preventing costly duplication
- it helps avoid duplication of field activities which can be detrimental to the environment
- it preserves materials for future testing in new and different ways thereby increasing the knowledge of an area without having to redrill or sample an area
- it makes public viewing of core and samples possible

An index to the locations of core and samples is being prepared for distribution in 1997.

For more information on the Mineral Core Research Facility, contact Tim Berezniuk or Dixon Edwards at the Alberta Geological Survey. ❖

Mineral Aggregate and Industrial Mineral Potential Evaluation and Mapping of the Northeastern Alberta Oil Sands and Kakwa-Wapiti Areas

by Dixon Edwards, Geologist

AGS geologist, Dixon Edwards, explores for industrial minerals.

Photo courtesy of Dixon Edwards

Industrial minerals, including mineral aggregate, are important to the economic development of Alberta. Infrastructure development such as roads, bridges, railways, runways, commercial and residential structures always require industrial minerals, but each region of Alberta has additional, specific needs and development opportunities. In the next 3 years, AGS researchers will be studying industrial minerals in northeastern Alberta (oil sands area) and the Kakwa-Wapiti area.

In northeastern Alberta, industrial minerals are developed and used in a variety of ways. For example, they may support existing industry. This is the case for mineral aggregate used for road access to oil sands and limestone for SO_2 emission control.

Industrial minerals such as sand and gravel, limestone, gypsum, silica, building stone, or clay may also develop as an independent industry. They may also represent a value-added component of an existing industry (e.g., sulphur from oil sands, and titanium/zirconium from oil sands tailings).

In the Kakwa-Wapiti area, resource (forestry, coal, petroleum) and recreational development require convenient, year-round access. This means that public land sources of mineral aggregate which least affect the environment must be found and leased to the private sector for development.

This process requires the discovery of many potential aggregate sites so that significant choice is available to government planners in terms of a few deposits for exploitation. For deposits selected, a detailed, long-term management plan is required to ensure minimal disturbance to the area and to guarantee that ample resources are in place for the next 100 years.

In northeastern Alberta, summary information and geological models developed by AGS staff will:

- aid industry in exploration programs to find aggregate and limestone
- help government assign Crown Land resources
- provide answers for enquiries on minerals with unknown potential (e.g. building stone, zeolite)
- assist the private sector in developing initiatives to pursue opportunities.

"This means that public land sources of mineral aggregate which least affect the environment must be found . . ."

The AGS will produce a mineral aggregate report for the Kakwa-Wapiti area. The report will provide government with comprehensive data for management and planning, also will assist the private sector by providing a solid information base on which to develop aggregate resources. In addition, industrial minerals studies in the area will be suitable for input into Special Places 2000 planning or as a guide to exploration in the area. ❖

Land-use Compilation Mapping Kakwa-Wapiti and Northeastern Alberta Oil Sands Areas

Dennis Chao, Geographer (Computing)

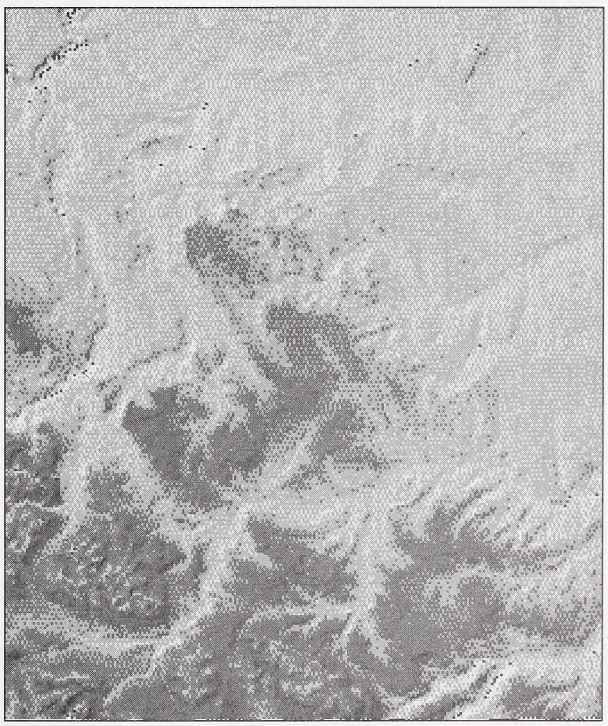
The focus of the Kakwa-Wapiti area research is to gather more information on the non-renewable resource potential for the government's proposed Integrated Resource Planning (IRP) process for the region. The study of the Northeastern Alberta Oil Sands area will concentrate on environmental concerns caused by increased drilling activities.

The Land-Use Planning Compilation Mapping initiative will utilize the Geographic Information System (GIS) technology to collect, integrate and manage existing and future data in a standard digital format, map projection and database. Types of data to be standardized include topographic, hydrographic, geological, exploration, environmental and cultural.

". . . the project will serve as an important input component to provincial land planners . . ."

Capitalizing on GIS spatial analytical and modelling capabilities, the project will serve as an important input component to provincial land planners during the development of the Kakwa-Wapiti IRP. The project will identify, in advance, any potential and/or possible conflicts of land utilization, and assist in creating a balance between industrial/economic development needs and environmental concerns in the Northern Alberta Oil Sands area.

Using a Geographic Information System to store, integrate, manage, and manipulate data has been used successfully at the AGS to study the Foothills region in recent years. Products in the form of digital maps and interactive spatial queries have assisted government, industry and energy planners in their decision-making processes. The basic methodology for integrating data into GIS for the Foothills has been well defined and can be used, with some modifications, for both areas now under study. ❖



Digital Elevation Model (DEM) of the Kakwa-Wapiti study area showing surface elevation.

Quaternary Geology of the Kakwa-Wapiti Area

by Mark Fenton, Geologist

A study of the Quaternary geology of the Kakwa-Wapiti area is one of the factors in the AGS integrated approach to the region in the next 3 years.

Although knowledge of Quaternary geology is essential to this equation, little information presently exists. This, despite the fact that the area likely underwent a complex Quaternary history with flow from Rocky Mountain, Cordilleran and Laurentide glacial centres.

Geologist inspecting a glacial sediment section in the Kakwa-Wapiti area.

Photo courtesy of John Pawlowicz

The objectives of this project area are to develop:

- an understanding of the Quaternary stratigraphy, ice flow directions and mineral dispersal patterns and history, and their contribution to Integrated Resource Planning, mineral exploration and resource development.
- an approach that will maximize the amount of information obtainable from a combination of existing small scale maps, subsurface data and limited field work to produce information at the 1:50,000 scale.

The first year will focus on the compilation and assessment of the existing data, and a preliminary field reconnaissance and ground truthing of the 1:250,000 surficial geology map. Subsequent study will include the preparation of a preliminary database and stratigraphic framework, and assessment of the feasibility of producing drift thickness and bedrock topography maps.❖

Bedrock Geology of the Kakwa-Wapiti Area of West Central Alberta

by Willem Langenberg, Geologist

A framework of the stratigraphy and structural geology of the Kakwa-Wapiti area is needed for land-use planning by government, as well as for exploration by industry. To obtain this framework, there is an urgent need for new, basic geological data. Data from surface and subsurface (drilling and seismic) will be integrated.

Geological maps of the Foothills part of the area (deformed belt) were recently completed by the GSC on a 1:50,000 scale. The plains part of the area (undeformed belt) is covered by 1:250,000 scale mapping by the GSC. Data from these maps will be integrated into the AGS data base. ❖

Exploration for coal in an anticline on Caw Ridge, north of Grande Cache. Land-use decisions are required here in the near future.

Photo courtesy of Willem Langenberg

Reservoir Characterization of the Athabasca Oil Sands Deposit

by Li-Ping Yuan, Geologist

The Athabasca oil sands deposit has been exploited by surface mining since 1970; however, the mineable area is only 10 percent of the entire deposit. The need for high initial capital investment and environmental concerns have hindered rapid development of this resource in the past.

Recent in-situ recovery technologies, particularly the Steam Assisted Gravity Drainage (SAGD) process and horizontal drilling, have demonstrated that bitumen can be recovered economically with a much reduced capital cost and fewer environmental effects. Such technologies require detailed geological and engineering information about oil sands reservoirs. For example, reservoir continuity and heterogeneity, and water zones are of paramount importance to in-situ recovery methods.

The objective of this project is to characterize and classify oil sands reservoirs in the Athabasca oil sands deposit. A proper reservoir characterization needs detailed information from densely drilled wells, outcrop studies, and/or high-resolution seismic data. This detailed information is not usually available; thus, a classification of reservoir type based on regional-scale information will be performed first. Several small areas with available detailed information will then be selected and their reservoir characteristics will be analyzed to represent different reservoir types.

Detailed reservoir characterization will include a correlation among closely spaced wells, outcrop work, log analysis and core studies to delineate the continuity and heterogeneity for different reservoir types. Other reservoir characteristics such as reservoir seal, thief (water) zones, gas cap and petrophysical properties (porosity and permeability) will also be assessed.

"Such technologies [SAGD and horizontal drilling] require detailed geological and engineering information about oil sands reservoirs."

Such reservoir classification and characterization of the Athabasca oil sands deposit will help industry in exploiting Alberta's oil sands resources, hopefully accelerating the economic development of the province. ❖

Mineral Assessment Reports

Metallic and Industrial Mineral Assessment Report Update (April 1996)
Report copies can be purchased (prices vary) from:

Alberta Geological Survey
Information Sales
7th Floor, Petroleum Plaza North
9945 - 108 Street
Edmonton Alberta T5K 2G6
Canada
Phone: (403) 422-3767
Fax: (403) 422-1918

Index Number 19950002
Ironcap Gold Property Assessment Report (Peace River Area)
Marum Resources Inc.
NTS 84D/9, 10, 15, 16
Gold
Permit No. 9390100001 to 9390100008

Index Number 19950003
Industrial and Metallic Mineral Assessment Report for Burmis Leases
393466 Alberta Ltd. By Western Diamex
NTS 82G/9
Magnetite
Permit No. 9389050002 and 9389060001

Index Number 19950004
Industrial and Metallic Mineral Assessment Report for Luckey 7 Property
Sentinel Resources Ltd.
NTS 72E/5
Diamond Indicator Minerals
Permit No. 9393030001

Index Number 19950005
Alberta Diamond Project Hinton Area, Central Alberta 1992 - 94 Exploration Activities
Cameco Corporation
NTS 83C/10, 11, 14, 16; 83F/1, 2
Permit No. 9393030015, 16, 18, 20, 22 to 34, 36 to 41, 46 to 48, 52, 60, 61

Index Number 19950006
Exploration Program on the Horseshoe Project, Peace River Area, Alberta
Ridgeway Petroleum Corp./Horseshoe Gold Mining Inc.
NTS 84C/2, 3, 6, 7,
Permit No. 9393030126 to 9393030135

Index Number 19950007
Industrial and Metallic Mineral Assessment Report for Consolidated Carina and Currie Rose Res.
Consolidated Carina and Currie Rose Res.
NTS 83C/2, 7, 11, 12, 13; 83N/10, 15
Permit No. 9393030121 to 0125, 0199, 0282

AGS Releases Two New Bulletins

BULLETIN NO. 63

Diamond Potential of Alberta

by Roy Eccles, Geologist

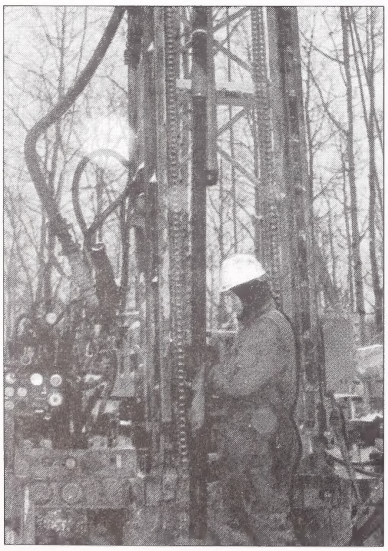
The AGS has released the results of a comprehensive, 3 year study into the potential for diamond-bearing deposits in Alberta. The results have been compiled into a 158-page report (*Bulletin No. 63*) that points out that Alberta may have moderate to high potential for diamondiferous diatremes and vent-related deposits.

This AGS study, funded by the Canada-Alberta Partnership on Minerals, was undertaken in response to the discovery of diamonds in kimberlitic diatremes in the Lac de Gras area of the Northwest Territories and the Fort à la Corne area of Saskatchewan. This exploration indicated that potential exists for the discovery of diamonds in other areas of Canada, including Alberta.

The primary objectives of this study were to identify geological anomalies and target areas for diamond exploration, and to provide selected geological, geophysical and geochemical data that would assist industry in its exploration for diamonds in Alberta.

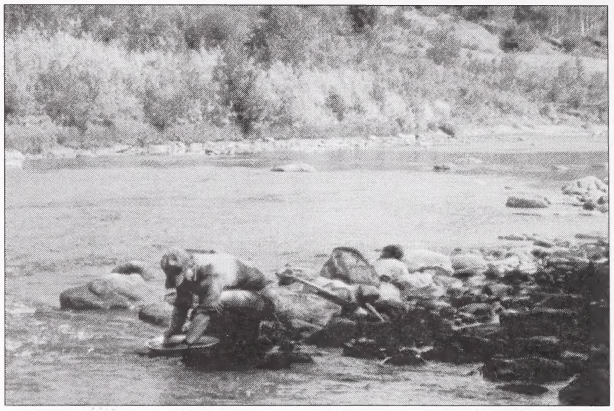
Alberta is favourable for diamondiferous deposits because the province is underlain by large areas of Precambrian crust that acted as "cool roots." As well, Alberta contains major faults, arches, grabens and other tectonic features that may have played an important role in acting as conduits for the intrusion of diamond-bearing kimberlitic or lamproitic diatremes.

There is evidence of at least four, and possibly five, ages of volcanic activity in Alberta, including early Late Cretaceous to Late Cretaceous, which was the most prolific time period for diamondiferous kimberlitic volcanism. Numerous, thick bentonites and tuffs exist in the Phanerozoic succession in Alberta, and may be the result of local volcanic venting or possibly kimberlitic and lamproitic intrusions as opposed to being from ash-fall debris derived from outside Alberta.



Drilling of the Mountain Lake kimberlite NE of Grande Prairie.

Photograph courtesy of G. M. Jean



Panning stream sediments for diamond indicator minerals.

Photograph courtesy of D. R. Eccles.

Diamond indicator mineral anomaly trends have been outlined in several places within Alberta, with some indicator grains (such as G3 ecolgitic and G10 pyropic garnets) having excellent chemistry. A large number of geological, geophysical and geochemical anomalies occur in Alberta, some of which may have been related to emplacement of potentially diamondiferous kimberlitic or lamproitic diatremes.

To date, exploration in Alberta has been successful in discovering a kimberlite intrusion, diamonds, and diamond indicator minerals, and in identifying abundant geophysical anomalies which may represent kimberlite or lamproite pipes or dykes. Diamonds are reported to have been discovered from streams north of Hinton, in surficial sediments west of Edmonton at locations near the Evansburg and Hinton area, in southern Alberta in the Sweetgrass Hills area, and in Cretaceous-Tertiary sediments southeast of Red Deer.

"A large number of geological, geophysical and geochemical anomalies occur in Alberta, some of which may have been related to emplacement of potentially diamondiferous kimberlitic or lamproitic diatremes."

Further studies will concentrate on diamond indicator mineral sampling from till, streams and bedrock. A joint drilling project targeting the Mountain Lake kimberlite was completed by AGS and the Geological Survey of Canada. The core will be stored in Edmonton at the Mineral Core Research Facility and be available to the public after the completion of a detailed study.

To obtain a copy of the abstract for the report contact the AGS Information Sales office. For further information contact Roy Eccles at the Alberta Geology Survey. ❖

BULLETIN NO. 64

Metallic Mineral Occurrences of the Exposed Precambrian Shield in Northeastern Alberta

by Willem Langenberg, Geologist

Information about 190 metallic mineral occurrences on the exposed Precambrian Shield of northeast Alberta was gathered from many sources and published in *AGS Bulletin No. 64*.

Sources of information include exploration reports by the minerals industry and AGS field work. AGS scientists conducted field programs in this area from 1956 to 1975 and again from 1992 to 1994 under the auspices of the Canada-Alberta Mineral Development Agreement.

"The documentation of these metallic mineral occurrences may serve as a starting point for future metallic mineral exploration on the exposed Precambrian Shield in Alberta."

The description of these metallic mineral occurrences provides models for mineral deposition, establishes exploration targets, and gives insights into the economic potential of commodities such as gold, uranium, base metals and rare earth elements. The documentation of these metallic mineral occurrences may serve as a starting point for future metallic mineral exploration on the exposed Precambrian Shield in Alberta. Among occurrences, 20 have been investigated sufficiently and are of sufficient exploration importance to be classified as a mineral showing. The report recommends that industry follow up on these showings.

The most interesting result is the presence of gold and base metals in metasedimentary belts, which were concentrated by shearing. Geochemical analyses of grab samples from deeply weathered sulfide horizons in shear zones of the Potts Lake, Waugh Lake, Doze Lake and Pythagoras Lake areas contain up to 3.2 g/t gold. This was an important discovery and resulted from AGS field work from a base camp at Waugh Lake during the summer of 1993. These results suggest the presence of shear-hosted Precambrian lode gold deposits. From preliminary rankings of various areas, gold showings in the Waugh Lake area appear to have the best economic potential for possible mine development.

The Selwyn Lake area contains copper anomalies, which are associated with a stratiformal, but shear-related sulfide zone. Although no large amount of precious or base metals was found, the concentration of pyrite-pyrrhotite is important.

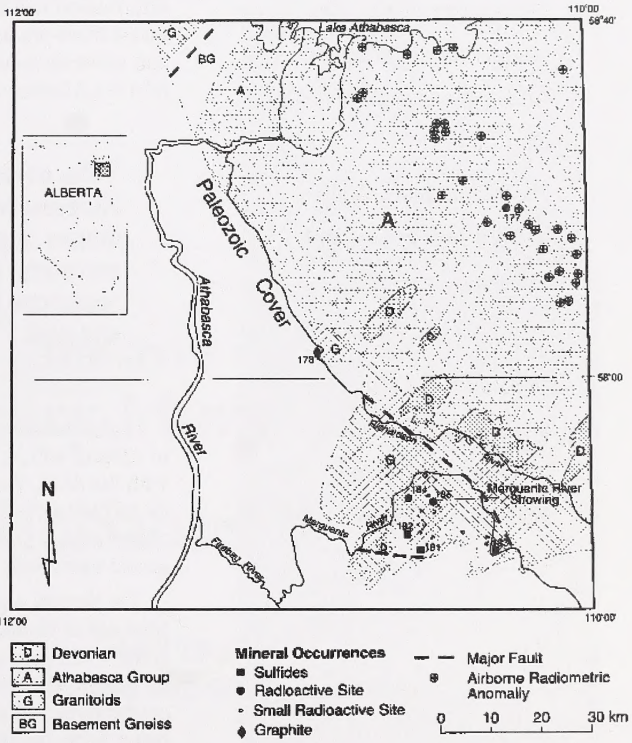
Quartz-tourmaline veins, which intrude granite and metasediments near Waugh Lake, contain gold in association with anomalously high arsenic, molybdenum and tungsten contents. These veins may indicate that potential exists for Precambrian lode gold deposits.

Uranium showings account for nearly half of the mineral occurrences presently known in the area. The majority of uranium mineralization is hosted in pegmatite and related granitoids. Their average grades are sub-economic at present.

"The most interesting result is the presence of gold and base metals in metasedimentary belts, which were concentrated by shearing."

The investigation of the metallic mineral potential of Northeastern Alberta was of considerable benefit to AGS, because it familiarized several staff with the geology of the Precambrian Shield, an area of Alberta that is remote and difficult to access. This bulletin reestablishes the AGS as the main source of geoscience information for this part of Alberta.

To obtain further information on this bulletin contact Willem Langenberg at the Alberta Geological Survey. ❖



Metallic mineral occurrences south of Lake Athabaska. The geology is based on Godfrey (1970) and Wilson (1986). The airborne radiometric anomalies are from Godfrey and Plouffe (1978).

Voice Mail is Arriving!

Alberta Geological Survey will be getting voice mail in the very near future. Soon you will be able to contact AGS staff members on their direct line.

The system should be up and running by the end of November.

To obtain a list of the phone numbers contact Karrie McLeod at (403) 422-1927. ❖

Alberta Signs Intergovernmental Geoscience Accord

The recent signing of the Intergovernmental Geoscience Accord will benefit government, industry and the Alberta taxpayer.

"Better coordination between the Alberta Geological Survey (AGS) and the Geological Survey of Canada (GSC) will result in better geoscience information," said Minister of Energy, Patricia Black. "High quality geoscience information will assist companies to invest more productively in the energy and minerals industries, creating more jobs for Albertans."

> **"The accord ... will increase cooperation, reduce duplication and better focus the resources of GSC and AGS."**

Under the accord, any GSC activities in Alberta will be done in consultation with the AGS. The GSC will also share its specialized equipment and expertise with the AGS to help meet provincial geoscience needs.

The accord, signed by Black and Minister of Natural Resources, Anne McLellan, in Edmonton on 18 September 1996, will increase cooperation, reduce duplication and better focus the resources of the GSC and the AGS.

The GSC carries out national geoscience programs to define the geology and resources of Canada. Programs include research, technology development and information transfer not available in programs of all provincial and territorial survey organizations. The GSC also operates marine and coastal studies that are unique among geological survey organizations.

The AGS carries out programs specific to the economic development and resource management of Alberta. Programs address provincial responsibilities and are geographically limited to the jurisdiction over resources, environment and land of the province. ❖

AGS/Energy Library

by Hanne Csanyi, Librarian

The Alberta Energy/Alberta Geological Survey Library was formed by the merging of the Department of Energy and AGS libraries in the spring of 1995. It has major collections in the areas of Energy and the Earth Sciences.

Included in these collections are:

- Canadian/American Geological Survey reports and maps (both federal and provincial/state),
- Canadian/ American energy related statistical information,
- scientific journals/magazines,
- company annual reports,
- Alberta mineral assessment reports, and
- a good collection of books pertaining to the energy and earth science fields.

As part of the NEOS Consortium of libraries, most of these collections are included in the GATE Online Catalog, accessible on the Internet at: http://gate.library.ualberta.ca

For more information contact Hanne Csanyi at csanyi@enr.gov.ab.ca ❖

Prize-winning Panner

AGS summer employee, Peter Lywood, proudly displays his first place prize for the daily gold panning competition held at this years Klondike Days. When asked about his technique, Peter said "my field work with the AGS prepared me well for the heavy competition I faced". As a summer student, Peter worked on diamond and metallic minerals projects. ❖

Enhancement to AGS Publications on WWW

by Andre Lytviak, Applications Analyst

The AGS first implemented a World Wide Web Service during 1994. The initial purposes of this service were to describe current activities, provide a mechanism for contacting AGS staff in their areas of expertise, and post a current list of publications available from the AGS Information Sales office.

During 1996 the list of publications is being enhanced by the addition of on-line abstracts for much of the available material. Abstracts of AGS Bulletins have been available on-line since June 1996. We expect that abstracts for many more types of AGS publications will be posted by November.

The current AGS web services can be viewed at:

http://www.energy.gov.ab.ca/ags/ags1/ags.html

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Publications Update

The following is a list of publications recently released for sale.

Bulletins

BUL 063 The diamond potential of Alberta. Dufresne, M. B., D. R. Eccles, B. McKinstry, D. R. Schmitt, M. M. Fenton, J. G. Pawlowicz, W. A. D. Edwards. $45.00

BUL 064 Metallic mineral occurrences of the exposed Precambrian Shield in Northeastern Alberta. Langenberg, C. W., D. R. Eccles. $30.00

Maps

MAP 230 Southern Alberta NATMAP project, Maycroft, Alberta - NTS 82G/16. Chao, D. K., R. J. H. Richardson, D. Fietz scale 1:50,000. $30.00

MAP 231 Southern Alberta NATMAP project Langford Creek, Alberta - NTS 82J/1. Chao, D. K., R. J. H. Richardson, D. Fietz scale 1:50,000. $30.00

Open File Reports

OFR 94-06 Mapping and resource evaluation of the tertiary and preglacial sand and gravel formations of Alberta. Edwards, D., D. Scafe, R. Eccles, S. Miller, T. Berezniuk, and D. Boisvert. $65.00

OFR 95-05 Stratigraphy, structure and mineral occurrences of the Aphebia Waugh Lake group, Northeastern Alberta. Iannelli, T .R., C. W. Langenberg, D. R. Eccles. $60.00

OFR 95-09 Quaternary stratigraphy and surficial geology Peace River - Winagami region, Alberta, year two report for the end fiscal year 1994-95. Balzer, S. A., L. E. Leslie, M. M. Fenton. $15.00

OFR 95-11 Preliminary stratigraphic tests to support mineral exploration: Northern Alberta. Pawlowicz, J. G., G. M. Jean, M. M. Fenton. $15.00

OFR 96-03 "Small coal-fired generation study", a data review. Richardson, R. J. H., D. K. Chao, D. Fietz. $200.00

OFR 96-04 Building stone from waste rock at operating and abandoned coal mines in Alberta foothills. Horachek, Y. $40.00

OFR 96-05 Preliminary mapping and field reconnaissance of the Lower to Upper Cretaceous (Middle Albian to Lower Turonian) stratigraphy - Northeastern Alberta. Cotterill, D., H. Berhane. $65.00

OFR 96-1A Hydrogeology of the Cold Lake study area Alberta, Canada. Part 1. Introduction, data base management system and data processing. Hitchon, B., A. Lytviak, S. Bachu. $10.00

OFR 96-1B Hydrogeology of the Cold Lake study area Alberta, Canada. Part 2. Regional geology. Hitchon, B., L. Andriashek. $10.00

OFR 96-1C Hydrogeology of the Cold Lake study area Alberta, Canada. Part 3. Hydrochemistry. Hitchon, B., D. Borneuf. $10.00

OFR 96-1D Hydrogeology of the Cold Lake study area Alberta, Canada. Part 4. Hydrodynamics. Sauveplane, C., D. Borneuf. $10.00

OFR 96-1E Hydrogeology of the Cold Lake study area Alberta, Canada. Part 5. Hydrometeorology. Hudson, H. $10.00

OFR 96-1F Hydrogeology of the Cold Lake study area Alberta, Canada. Part 6. Numerical simulation of fluid flow. Bachu, S. $10.00

OFR 96-1G Hydrogeology of the Cold Lake study area Alberta, Canada. Part 8. Geothermal regime. Bachu, S. $10.00

OFR 96-1H Hydrogeology of the Cold Lake study area Alberta, Canada. Data base: section 1 - Phanerozoic data. Ing, A., S. O'Connell, B. Hitchon, C. Sauveplane. $15.00

OFR 96-1I Hydrogeology of the Cold Lake study area Alberta, Canada. Data base: section 2 - Quaternary data. Andriashek, L., D. Borneuf, C. Sauveplane. $15.00

OFR 96-1J Hydrogeology of the Cold Lake study area Alberta, Canada. Data base: section 3 - Instrumentation for hydrogeological investigations. Borneuf, D. $10.00

OFR 96-2A Evaluation of deep waste disposal Cold Lake area, Alberta and Saskatchewan: local effects. Bachu, S. $10.00

OFR 96-2B Evaluation of deep waste disposal Cold Lake area, Alberta and Saskatchewan: regional effects. Bachu, S. $15.00

A complete list of publications is available from the address below.

Alberta Geological Survey publications are available from:

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